

IN THE CLAIMS:

A complete listing of all the claims is presented as follows:

Claim 1. (Currently Amended).

A process for preparing an enantiopure ~~or enantioenriched~~ substituted 1,3-dioxolan-4-one or an enantiopure ~~or enantioenriched~~ substituted 1,3-oxathiolan-5-one which comprises

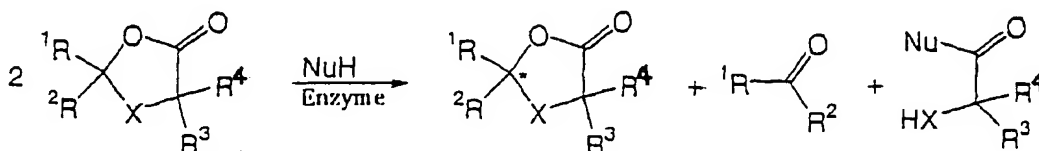
bringing a mixture containing a substance selected from the group consisting of a racemic 1,3-dioxolan-4-one and a racemic 1,3-oxathiolan-5-one and an enzyme with hydrolytic activity into contact with an effective amount of a nucleophile to effect the biotransformation; cleaving ~~a~~ the dioxolane or oxathiolane ring of one enantiomer selected from the group consisting of the 1, 3-dioxolan-4-one ring and the 1,3-oxathiolan-5-one ring by the enzyme with hydrolytic activity; and

after the cleaving of one enantiomer has taken place, isolating the uncleaved enantiomer selected from the group consisting of the 1,3-dioxolan-4-one and 1,3-oxathiolan-5-one.

Claim 2. (Currently Amended).

The process as claimed in claim 1,

wherein a mixture containing a substance selected from the group consisting of the racemic substituted 1,3-dioxolan-4-one and the racemic substituted 1,3-oxathiolan-5-one is cleaved by means of an enzyme which is able to cleave an ester linkage in the presence of a nucleophile (NuH) as depicted in the equation,



where X = oxygen or sulfur and

the radicals R¹ and R² are different and are selected independently of one another from the group consisting of H, substituted or unsubstituted C₆-C₁₈-aryl, substituted or unsubstituted C₃-C₁₈-heteroaryl, substituted or unsubstituted C₁-C₁₈-alkyl, substituted or unsubstituted C₂-C₁₈-alkenyl, substituted or unsubstituted C₂-C₁₈-alkynyl, substituted or unsubstituted C₆-C₁₈-aryl-C₁-C₁₈-alkyl, substituted or unsubstituted C₃-C₁₈-heteroaryl-C₁-C₁₈-alkyl, substituted or unsubstituted C₆-C₁₈-aryl-C₂-C₁₈-alkenyl, substituted or

unsubstituted C₃-C₁₈-heteroaryl-C₂-C₁₈-alkenyl, substituted or
 unsubstituted C₁-C₁₈-alkoxy-C₁-C₁₈-alkyl, substituted or
 unsubstituted C₁-C₁₈-alkoxy-C₂-C₁₈-alkenyl, substituted or
 unsubstituted C₆-C₁₈-aryloxy-C₁-C₁₈-alkyl, substituted or
 unsubstituted C₆-C₁₈-aryloxy-C₂-C₁₈-alkenyl, substituted or
 unsubstituted C₃-C₈-cycloalkyl, substituted or unsubstituted
 C₃-C₈-cycloalkyl-C₁-C₁₈-alkyl, substituted or unsubstituted
 C₃-C₈-cycloalkyl-C₂-C₁₈-alkenyl, and substituted or unsubstituted
 CR⁸R⁹-O_n-(CO)_m-R¹⁰ and

the radicals R³ and R⁴ are selected independently of one
 another from the group consisting of H, substituted or
 unsubstituted C₆-C₁₈-aryl, substituted or unsubstituted
 C₃-C₁₈-heteroaryl, substituted or unsubstituted C₁-C₁₈-alkyl,
 substituted or unsubstituted C₂-C₁₈-alkenyl,
 substituted or unsubstituted C₂-C₁₈-alkynyl, substituted or
 unsubstituted C₆-C₁₈-aryl-C₁-C₁₈-alkyl, substituted or unsubstituted
 C₃-C₁₈-heteroaryl-C₁-C₁₈-alkyl, substituted or unsubstituted
 C₆-C₁₈-aryl-C₂-C₁₈-alkenyl, substituted or unsubstituted
 C₃-C₁₈-heteroaryl-C₂-C₁₈-alkenyl, substituted or unsubstituted
 C₁-C₁₈-alkoxy-C₁-C₁₈-alkyl, substituted or unsubstituted
 C₁-C₁₈-alkoxy-C₂-C₁₈-alkenyl, substituted or unsubstituted
 C₆-C₁₈-aryloxy-C₁-C₁₈-alkyl, substituted or unsubstituted
 C₆-C₁₈-aryloxy-C₂-C₁₈-alkenyl, substituted or unsubstituted
 C₃-C₈-cycloalkyl, substituted or unsubstituted C₃-C₈-cycloalkyl

-C₁-C₁₈-alkyl, and substituted or unsubstituted

C₃-C₈-cycloalkyl-C₂-C₁₈-alkenyl ~~and~~ or

the radicals R³ and R⁴ form, together with the carbon to which they are bonded, an unsubstituted or substituted or a heteroatom-containing cycloalkylidene and

Nu is OR⁵, SR⁵ or NR⁶R⁷, where

the radical R⁵ is selected from the group consisting of H, substituted or unsubstituted C₁-C₁₈-alkyl, substituted or unsubstituted C₂-C₁₈-alkenyl, substituted or unsubstituted C₂-C₁₈-alkynyl, substituted or unsubstituted C₆-C₁₈-aryl -C₁-C₁₈-alkyl, substituted or unsubstituted C₃-C₁₈-heteroaryl -C₁-C₁₈-alkyl, substituted or unsubstituted C₆-C₁₈-aryl -C₂-C₁₈-alkenyl, substituted or unsubstituted C₃-C₁₈-heteroaryl -C₂-C₁₈-alkenyl, and

the radicals R⁶ and R⁷ are selected independently of one another from the group consisting of H, substituted or unsubstituted C₁-C₁₈-alkyl, substituted or unsubstituted C₂-C₁₈-alkenyl, substituted or unsubstituted C₂-C₁₈-alkynyl, substituted or unsubstituted C₆-C₁₈-aryl, substituted or unsubstituted C₃-C₁₈-heteroaryl, substituted or unsubstituted C₆-C₁₈-aryl-C₁-C₁₈-alkyl, substituted or unsubstituted

C₃-C₁₈-heteroaryl-C₁-C₁₈-alkyl, substituted or unsubstituted
C₆-C₁₈-aryl-C₂-C₁₈-alkenyl, and substituted or unsubstituted
C₃-C₁₈-heteroaryl-C₂-C₁₈-alkenyl

and the radicals R⁸ and R⁹ are selected independently of one another from the group consisting of substituted or unsubstituted C₆-C₁₈-aryl, substituted or unsubstituted C₃-C₁₈-heteroaryl, substituted or unsubstituted C₁-C₁₈-alkyl, substituted or unsubstituted C₂-C₁₈-alkenyl, substituted or unsubstituted C₂-C₁₈-alkynyl, substituted or unsubstituted C₆-C₁₈-aryl-C₁-C₁₈-alkyl, substituted or unsubstituted C₃-C₁₈-heteroaryl-C₁-C₁₈-alkyl, substituted or unsubstituted C₆-C₁₈-aryl-C₂-C₁₈-alkenyl, substituted or unsubstituted C₃-C₁₈-heteroaryl-C₂-C₁₈-alkenyl, substituted or unsubstituted C₁-C₁₈-alkoxy-C₁-C₁₈-alkyl, substituted or unsubstituted C₁-C₁₈-alkoxy-C₂-C₁₈-alkenyl, substituted or unsubstituted C₆-C₁₈-aryloxy-C₁-C₁₈-alkyl, substituted or unsubstituted C₆-C₁₈-aryloxy-C₂-C₁₈-alkenyl, substituted or unsubstituted C₃-C₈-cycloalkyl, substituted or unsubstituted C₃-C₈-cycloalkyl-C₁-C₁₈-alkyl, and substituted or unsubstituted C₃-C₈-cycloalkyl-C₂-C₁₈-alkenyl ~~and~~ or

the radicals R⁸ and R⁹ form, together with the carbon to which they are bonded, an unsubstituted or substituted or a heteroatom-containing cycloalkylidene, and
m and n are, independently of one another, 0 or 1, and

the following applies to the radical R¹⁰:

if m is 0 then the radical R¹⁰ is selected from the group consisting of substituted or unsubstituted C₁-C₁₈-alkyl, substituted or unsubstituted C₂-C₁₈-alkenyl ~~or~~ and substituted or unsubstituted C₂-C₁₈-alkynyl, substituted or unsubstituted C₆-C₁₈-aryl, substituted or unsubstituted C₃-C₁₈-heteroaryl, substituted or unsubstituted silaalkyl ~~or~~ and substituted or unsubstituted silaaryl, and

if m is 1 then the radical R¹⁰ is selected from the group consisting of substituted or unsubstituted aryl, substituted or unsubstituted C₁-C₁₈-alkyl, substituted or unsubstituted C₂-C₁₈-alkenyl ~~or~~ and substituted or unsubstituted C₂-C₁₈-alkynyl; and

~~said~~ each substituted radical is substituted by a group selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroaryl, hydroxyl, alkoxy, carboxylate, alkoxycarbonyl, amino, nitro, and halo; and

wherein if said radical contain a heteroatom, it is selected from the group consisting of O, N, and S.

Claim 3. (Original).

The process as claimed in claim 1,

wherein the enzyme with hydrolytic activity is selected from the group consisting of a lipase and an esterase.

Claim 4. (Previously Presented).

The process as claimed in claim 1,
wherein the enzyme is employed in a manner selected from the group consisting of in solution form and in immobilized form.

Claim 5. (Previously Presented).

The process as claimed in claim 1,
wherein the enzyme to dioxolanone or oxathiolanone ratio, calculated as molar ratio between enzyme and dioxolanone or oxathiolanone, is from 1:1,000 to 1:50,000,000.

Claim 6. (Original).

The process as claimed in claim 1,
wherein the nucleophile is an oxygen-containing nucleophile.

Claim 7. (Original).

The process as claimed in claim 6,
wherein the oxygen-containing nucleophile is selected from the group consisting of a lower unbranched alcohol and water.

Claim 8. (Original).

The process as claimed in claim 7,

wherein the lower unbranched alcohol is selected from the group consisting of methanol and ethanol.

Claim 9. (Currently Amended).

The process as claimed in claim 1,
which is carried out in the presence of a ~~cosolvent~~ solvent.

Claim 10. (Currently Amended).

The process as claimed in claim 9,
wherein the ~~cosolvent~~ solvent is selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons, halogenated hydrocarbons, ethers, alcohols, esters, acetonitrile and mixtures thereof.

Claim 11. (Original).

The process as claimed in claim 1,
wherein the reaction is carried out at temperatures between 0 and 75° C.

Claim 12. (Original).

The process as claimed in claim 1,
wherein the reaction is carried out for between 10 minutes and 7 days.

Claim 13. (Currently Amended).

The process as claimed in claim 1,
wherein the uncleaved enantiomer is isolated by removing
byproducts of the reaction ~~and a solvent~~.

Claim 14. (Original).

The process as claimed in claim 13,
wherein the byproducts are removed by a manner selected from
the group consisting of extraction and distillation.